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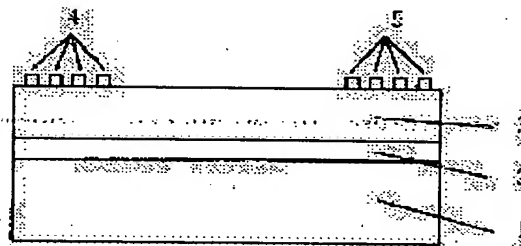
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(54) SURFACE ACOUSTIC WAVE DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To solve problems of a conventional surface acoustic wave device that cannot have made a k_2 compatible with a sound velocity and a temperature characteristic because a KNbO_3 crystal substrate is excellent in the k_2 but its sound velocity is slower than that of a SrTiO_3 substrate or a CaTiO_3 that belongs to the same perovskite group oxide as the KNbO_3 crystal substrate and its temperature characteristic is inferior to that of a SiO_2 substrate and that cannot have produced epitaxial growing on a Si substrate that is important in the monolithic processing in a direction of a pseudo cubic system (100) equivalent to that of a Y-XKNbO_3 crystal substrate.

SOLUTION: A $\text{K}_{1-x}\text{Na}_x\text{Nb}_{1-y}\text{Ta}_y\text{O}_3$ ($0 \leq x \leq 1$, $0 \leq y < 1$) piezoelectric thin film 3 oriented as the pseudo cubic system (10) is epitaxially grown on a Si substrate oriented in the (100) via a NaCl group oxide MO buffer layer 2 to realize the surface acoustic wave element having a high k_2 , a high sound velocity and a zero temperature characteristic.



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